

Methods to Desuperheat Steam

Steam supplied to a Superchanger unit for heating purposes should be saturated steam and not superheated steam for two reasons:

1. The temperature of steam with superheat may be excessive for the gaskets and cause them to harden/deteriorate.
2. Our computer-sizing model is always based on the saturation temperature of the steam, and a dry condition in the exchanger due to superheat may affect proper heat transfer.

Process steam will generally have superheat if it has passes through a pressure-reducing valve. This is due to the fact that while the valve reduces the pressure, it does not remove the entire difference in heat content. As such, the steam at the reduced pressure has a temperature above its saturation temperature.

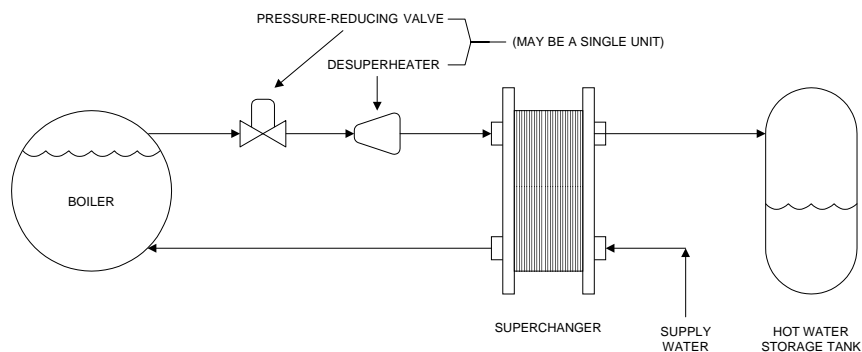
Consider the following data on steam properties under two conditions:

	Saturated Steam	
	150 psig	50 psig
Temperature (°F)	366	298
Total heat content (BTU/lb)	1196	1179

When 150 psig saturated steam is reduced to 50 psig, approximately 17 BTU/lb (1196 – 1179) must be removed in order for the 50 psig steam to be saturated. When this state is achieved, optimum heat transfer conditions exists, and the resulting temperature will also be compatible with the gasket section.

Some options to achieve this condition are:

1. Install a desuperheater. Schutte & Koerting of Cornwall Heights, PA and Spence Engr. Co. of Walden, NJ represent but two firms capable of supplying such units. Copes-Vulcan of Lake City, PA supplies units that reduce pressure and temperature simultaneously.



2. Pipe a small water line (usually 1/4") into the steam line a few feet ahead of the exchanger, and inject water through an atomizing-type spray nozzle. Regulate the water flow rate via a temperature gauge at the steam inlet nozzle.
3. Same as #2, except return the condensate with a small pump.